AMENDMENT TO THE SPECIFICATION:

Please amend the following three specification paragraphs as indicated.

Page 2, lines 15-22.

Mask defects can further be classified as hard vs. soft defects, as disclosed in the aforementioned Skinner article. A soft defect is typically any defect that can be removed by a cleaning process, whereas a hard defect cannot be removed by a cleaning process. Typically, for example, particles, contamination, residue, stains, etc. on the chrome/quartz would be called soft defects. Also, missing or extra features in the chrome/absorber/phase shifter (see below) e.g., pinholes, quartz pits, etc. would be called hard defects. Types of hard defects include, for example, pinholes, pinspots, intrusions, corner defects, missing features, absorber transmission defects, protrusions, and semi-transparent defects in a clear area.

Page 3, line 21 to page 4, line 4.

Microchips are most commonly commercially produced using optical lithography, a process in which a photosensitive resist is spun on the substrate [[to]] for patterning and then selectively exposed by UV light through a photomask or reticle. The need for more sophisticated, faster and denser devices has reduced the minimum feature size the microchips (the critical dimension, CD) by a 0.7 factor every three years – a model known as Moore's Law ["International Roadmap for Semiconductors (Lithography)", International SEMATEC, 2000]. The minimum feature size and spacing in the photomasks used to fabricate them has shrunk proportionally. However, photomask feature dimensions are currently approaching their theoretical physical limit. Quantum effects such as tunneling and particle-wave interference effects can become important for device performance as shrinking continues to nanometer scales. Photomasks are thus increasingly precise, complex (with the addition of optical proximity correction (OPC) and the use of techniques such as phase shifting and off-axis illumination, OAI

and therefore increasingly expensive, for example, typically above $50,000 per unit for alternating phase shift masks. A different photomask is required for each lithography exposure, in other words for each layer in the microchip. More than a dozen mask may be required for some designs. Lithography thus represents one of the largest fixed costs associated with chip production (typically, approx. 1/3 of the total). The total cost for a 90-nm mask can be about one million dollars.

Page 5, lines 22-27.

Attenuating PSMs (having weak-shifters) [[relies]] rely on the deposition of a partially transmitting, 180°-phase-shifting material (e.g. molybdenum silicide). Light diffracted from a clear opening in the photomask will destructively interfere with light from the phase-shifted areas, improving contrast. Additive repair of such photomasks relies on the deposition of a layer with similar overall optical properties (transparency, index of refraction), which may be achieved by precise control of the chemistry and the thickness of the patch.

Page 15, line 24 to page 16, line 10.

Figures 3A and 3B together provide[[s]] an additional schematic diagram of a possible additive/subtractive photomask-repair apparatus. It is possible to simultaneously or sequentially repair both clear and opaque defects with the same instrument in the same session, if combining DPN™ printing technology with nanomachining and/or DPN™ printing-assisted nanomachining. An array of two active microfabricated cantilevers is brought in close proximity with the photomask wafer (1), for example by monitoring the cantilever deflection during approach. The defect (2) to repair is located e.g. by a combination of actinic optical microscopy and low-force, high-speed SPM imaging of the wafer associated with pattern recognition software. The left probe (3) is supplied with and coated with an ink, while the right one, a high-force-constant cantilever, capable of applying high contact force and/or delivering a second ink can and can serve as a nanomilling tool. The cantilevers can be individually actuated, e.g. by the thermal expansion of a bimorph formed by a metallic heater on the back of the cantilever and the

structural material of the cantilever itself. In the additive repair mode [A], probe 3 is brought in contact with the substrate and rastered at slow speeds to fill the clear defect area. In the subtractive repair mode [B], probe 4 applies a large force to areas where spurious metal has been deposited in order to scrape it. Or probe 4 can remove spurious metal by rastering multiple times the area to scrape it. The probe 4 may be optionally coated with an ink (5) that serves as a lubricant and/or etchant during nanofabrication and nanomachining (hence, it can be a DPN™ printing-assisted nanomachining).